

Amendments to the Claims:

This listing of claims will replace all prior listings of claims in the application.

Listing Of Claims:

Claims 1-24 (canceled).

Claim 25 (currently amended) A position detection method for detecting a position of a substrate in a detection direction of a position detection mark substantially parallel to a surface of the substrate upon receiving light from the position detection mark formed in a shot on the surface of the substrate, comprising:

an image information acquisition step of obtaining two-dimensional image information of the position detection mark from the light that has been received by an image sensor having a plurality of lines of which a plurality of pixels are arrayed in a detection direction of the position detection mark substantially parallel to the surface of the substrate and in a direction orthogonal to the detection direction;

a conversion step of converting the image information to a plurality of light-intensity signals for each line of the plurality of lines, the plurality of light intensity signals being primary image signals obtained from the lights from different areas of a ~~mask~~ mark area in the shot in the direction of the position detection mark substantially parallel to the surface of the substrate and in the direction orthogonal to the detection direction;

a determination step of determining whether the light-intensity signal of each line of the plurality of lines is valid or not; and

a position information calculation step of calculating position information of the position detection mark from light-intensity signals of only valid lines other than light-intensity signals of invalid lines.

Claim 26 (previously presented) The method according to claim 25, wherein said determination step includes finding intervals of the position detection marks and determining that a valid light-intensity signal is a light-intensity signal of a line for which a deviation with respect to an average signal of the mark intervals found for all lines is less than a predetermined value.

Claim 27 (previously presented) The method according to claim 25, further comprising:

an error information calculation step of calculation information representing an error of a position detection mark, which corresponds to the position information, with respect to a reference position; and

a residual-error information calculation step of calculating residual-error information that is the result of eliminating a prescribed error component from the information representing the error; wherein said determination step includes determining that a light-intensity signal of a line for which the residual-error information is less than a predetermined value is valid.

Claim 28 (previously presented) The method according to claim 25, wherein the substrate is a semiconductor substrate supplied to a semiconductor manufacturing process, and the position detection marks include at least one of a preceding-step mark formed by etching at a preceding step and a present-step mark formed by a resist at a step that follows said preceding step.

Claim 29 (previously presented) The method according to claim 25, wherein the substrate is a semiconductor substrate supplied to a semiconductor manufacturing process, and the position detection marks include at least one of a preceding-step mark formed by etching at a

preceding step and a present-step mark formed by a resist at a step that follows said preceding step; and

said error-information calculation step calculates information representing an error between the preceding-step mark and the present-step mark.

Claim 30 (previously presented) The method according to claim 25, wherein a position detection mark is provided also in the direction that is substantially orthogonal to the direction in which the position detection marks are detected, and said image information acquisition step further calculates image information of this position detection mark in the direction substantially orthogonal to the direction in which the position detection marks are detected.

Claim 31 (previously presented) The method according to claim 25, wherein said image information acquisition step calculates image information that has been rotated through a predetermined angle with respect to the direction in which the position detection marks are detected.

Claim 32 (previously presented) The method according to claim 27, wherein if x and y directions are taken as mutually orthogonal directions having the reference position as the origin thereof, the information representing the error is represented, as a deviation in the position of the position detection mark from the reference position, by shift S_x in the x direction, shift S_y in the y direction, inclination θ_x with respect to the x axis, inclination θ_y with respect to the y axis, magnification B_x along the x direction and magnification B_y along the y direction, and the prescribed error component is obtained in accordance with the following equation:

$$D' i = \begin{pmatrix} B_x & -\theta_y \\ \theta_x & B_y \end{pmatrix} D i + \begin{pmatrix} S_x \\ S_y \end{pmatrix}.$$